

Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in this application:

Listing of Claims

1-82. (Canceled)

83. (Currently amended) A connector for use in making an artificial, fluid-tight, hollow, annular connection between an end portion of a tubular graft conduit and a side wall of a tubular body conduit in a patient via an artificially created aperture in the side wall of the tubular body conduit so that the tubular graft conduit extends from the tubular body conduit outside of the tubular body conduit and the patient's body fluid can flow between lumens of the tubular graft conduit and the tubular body conduit via the connection, the connector comprising:

a structure which is annularly continuous and configured for disposition annularly around the outside of the tubular graft conduit so that the structure forms a continuous and uninterrupted ring all the way around the outside of the tubular graft conduit;

a plurality of first members extending from the structure in an annular array which is substantially concentric with the structure, the first members being

resiliently biased to extend substantially radially out from the structure and being elastically deflectable substantially parallel to a central longitudinal axis of the structure; and

a plurality of second members extending from the structure in an annular array which is substantially concentric with the structure, the second members being resiliently biased to extend substantially radially out from the structure and being elastically deflectable substantially parallel to the central longitudinal axis of the structure, the first members being configured to pass through the side wall of the tubular graft conduit at respective locations that are spaced from one another around the side wall of the tubular graft conduit, and the first and second members being further configured to reach respective locations on the side wall of the tubular body conduit that are spaced annularly around the aperture when the connector is in use and the first and second members are extending substantially radially out from the structure, wherein the structure includes a plurality of closed shapes, each of which has an open center, and each of which is compressible and expandable in a direction that is annular of the structure, all of said shapes being connected to one another in a single row that extends annularly around the structure and so that open centers of all of said shapes are disposed in said single

row, each said closed shape being connected to a next adjacent closed shape in said row along only a central portion of a length of a side of said shape that is transverse to said direction, end portions of the length of that side that continue beyond either end of the central portion being spaced from the next adjacent closed shape in the direction that is annular of said structure, so that expansion of any of said shapes in the direction that is annular of said structure causes the entirety of said structure and the entirety of said connector to annularly enlarge.

84. (Previously presented) The connector defined in claim 83 wherein the first and second members extend from respective first and second axially spaced portions of the structure.

85. (Previously presented) The connector defined in claim 83 wherein when the first and second members are deflected substantially parallel to the central longitudinal axis of the structure, they extend in respective opposite directions away from the structure.

86. (Previously presented) The connector defined in claim 83 comprising nitinol.

87. (Previously presented) The connector defined in claim 83 wherein the first and second members are further configured for disposition on respective opposite sides of the side wall of the tubular body conduit when the connector is in use and the first and second members are extending substantially radially out from the structure.

88. (Canceled)

89. (Previously presented) The connector defined in claim 83 wherein the structure is configured for axial flexibility.

90. (Previously presented) The connector defined in claim 83 wherein the structure and the first and second members are all one piece.

91. (Withdrawn) A method of making a medical graft connector comprising:

providing a tube of an elastic material;
cutting a first axial end portion of the tube at a plurality of locations spaced circumferentially around the first axial end portion to convert the first axial end portion to a first plurality of fingers that extend substantially axially;

cutting a second axial end portion of the tube at a plurality of locations spaced circumferentially around

the second axial end portion to convert the second axial end portion to a second and a third plurality of fingers that extend substantially axially, wherein the second and third pluralities of fingers are arranged in an alternating configuration;

cutting the medial portion of the tube at a plurality of locations spaced circumferentially around the medial portion with substantially axial "U"-shaped cuts to provide a fourth plurality of fingers that extend substantially axially within the medial portion thereof;

deflecting at least some of the fingers radially out from the medial portion; and

setting the fingers as deflected in the deflecting.

92. (Withdrawn) The method defined in claim 91 wherein the setting comprises:

heat treating the fingers.

93. (Withdrawn) The method of making a medical graft assembly comprising:

making a medical graft connector by the method defined in claim 91; and

substantially coaxially attaching the medical graft connector to a tubular graft conduit such that at least one of the fingers pierces the graft conduit.

94. (Withdrawn) The method of making a medical graft assembly comprising:

making a medical graft connector by the method defined in claim 91; and

substantially coaxially attaching the medical graft connector to a tubular graft conduit such that at least one of the fingers is received in an interior lumen of the graft conduit.

95. (Withdrawn) The method of making an assembly for installing a medical graft comprising:

making a medical graft assembly by the method defined in claim 91; and

substantially coaxially surrounding the medical graft assembly with a delivery structure which elastically deflects at least some of the fingers radially inward toward parallelism with a longitudinal axis of the connector.

96. (Withdrawn) The method of installing a medical graft comprising:

providing an assembly for installing a medical graft by the method defined in claim 95;

inserting the delivery structure through an aperture in a side wall of a patient's tubular body conduit; and

moving the delivery structure relative to the medical graft assembly and the existing tubular body conduit so that the delivery structure is removed from the aperture but the medical graft connector is left extending through the aperture with at least some of the fingers again extending substantially radially out from the medial portion inside the tubular body conduit.

97. (Withdrawn) The method defined in claim 96, wherein the delivery structure is flexible, and wherein the step of inserting the delivery structure includes:

passing the delivery structure intraluminally along a lumen of the patient's existing tubular body conduit; and

passing the delivery structure from within the lumen to outside the existing body conduit.

98. (Withdrawn) A method for removing a section of a tubular body conduit disposed within a patient for use as a graft conduit, comprising:

exposing a section of the body conduit;

closing first and second end portions of the body conduit;

closing lateral conduits and severing the lateral conduits downstream from the lateral conduit closing points;

inserting a distal end portion of a catheter into the conduit though an incision adjacent the first end portion of the body conduit;

advancing the distal end portion of the catheter to a location adjacent the second end portion of the body conduit;

cutting the body conduit at a location between the distal end of the catheter and the second end portion of the body conduit at an oblique angle with respect to the longitudinal axis;

cutting the body conduit and the catheter at a location adjacent the incision at a substantially right angle with respect to the longitudinal axis of the body conduit;

and

removing the body conduit and the catheter from the patient.

99. (Withdrawn) A method of connecting an axial end portion of a tubular graft conduit to a side wall of a

patient's tubular body conduit via an aperture in that side wall comprising:

providing a connector having a plurality of fingers, the fingers being movable between a first configuration wherein the fingers extend radially outward and a second configuration wherein the fingers extend substantially axially;

expanding an axial end portion of the graft conduit to a radially flared configuration;

piercing the flared end portion of the graft conduit with the fingers from an outer surface of the graft to an inner surface of the graft while maintaining the fingers in the second configuration;

allowing the fingers to return to the first configuration such that the end portion of the graft conduit is maintained in the radially flared configuration;

providing a sleeve configured to surround the connector and graft conduit and sized to deflect the resilient fingers toward the second configuration; and

before piercing the end portion of the graft conduit with the resilient fingers, surrounding the connector with the sleeve to maintain the resilient fingers in the second configuration.